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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/527,809	11/09/2005	Hiroshi Ichikawa	52433/789	8919

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EXAMINER	
MCGUTHRY BANKS, TIMA MICHELE	
ART UNIT	PAPER NUMBER
1793	
MAIL DATE	DELIVERY MODE
06/24/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/527,809	ICHIKAWA ET AL.	
	Examiner	Art Unit	
	TIMA M. MCGUTHRY-BANKS	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 May 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *26-33,35,37,38 and 41-43* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *26-33,35,37,38 and 41-43* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

Claims 1-25, 34, 36, 39 and 40 are cancelled, Claims 26, 27, 37 and 38 are currently amended and Claims 28-33, 35 and 41-43 are as previously presented.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/26/2009 has been entered.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 26-33, 35, 37, 38 and 41-43 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In Claims 26, 27, 37 and 38, applicant has support for the limitation of

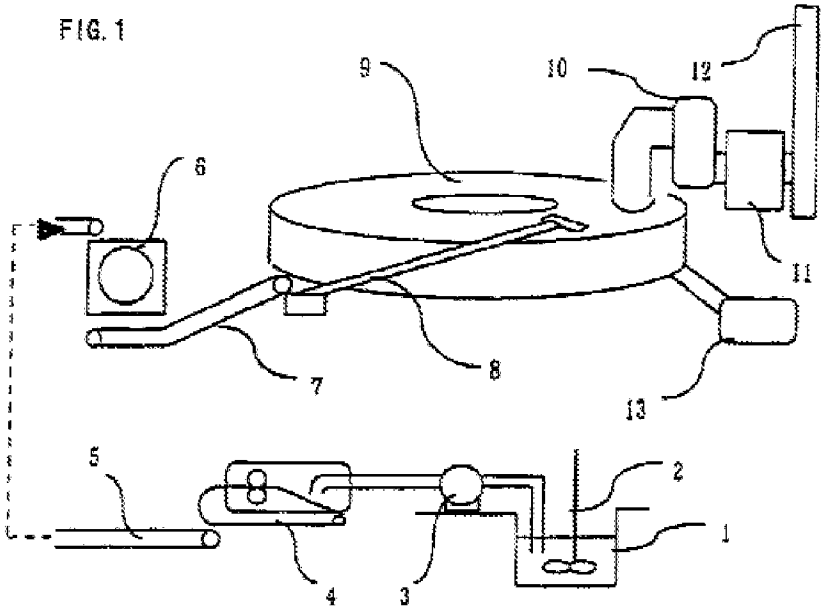
solubilizing alkali salts. However, applicant does not provide support for minimizing leaching of Zn or Pb. Therefore, these claims and all claims dependent thereon are rejected under this statute.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 26-33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ibaraki et al (US 6,755,888 B2) in view of Myerson et al (US 5,851,490), Roux et al (US 6,500,229) and Hoffman et al (US 6,648,942).

Ibaraki et al teaches a method for reducing metal oxide in a reducing furnace (abstract) as shown in FIG. 1:



The metal oxides come from a powdery raw material including EAF dust, BOF dusts, mill scale and others (column 7, lines 21-26). The powdery raw material is mixed with water (line 39) and a carbon containing powder (line 18) to make a slurry. The slurry is dehydrated (line 66), and the material is sent to a rotary hearth furnace (abstract) that has a dust collector (column 14, line 98). Regarding Claim 29, the slurry can contain up to 100% water, which is within the claimed range, and the slurry is dehydrated to a moisture content of 16-26% (abstract), which is also within the claimed range. Regarding Claim 30, the powder is mixed with water with a stirrer (column 7, lines 15 and 16). Ibaraki et al is silent with respect to the mixing temperature, which reads on ambient conditions and is within the claimed range. Regarding Claim 31, Ibaraki teaches the powder filling rate of the pellets is about 0.65-0.75 (column 9, lines 29 and 30), which reads on a porosity of at least 35%. The pellets are fed to the rotary hearth furnace. Regarding Claim 32, 16-26% moisture (abstract) is within the claimed range. The article has a thickness or diameter of 30 mm or less (Claim 6) which overlaps the claimed range. Regarding Claim 33, Ibaraki et al teaches that the amount of fixed carbon contained in the shaped articles is 1.5 times or less than the molar number of fixed carbon figured out on the assumption that it reacts with oxygen combined with iron oxide to produce carbon monoxide (column 12, lines 39-42). An example of furnace temperature is 1210 °C and the time is 15 minutes (column 15, lines 41-44). It would have been obvious to one of ordinary skill in the art at the time the invention was made that Ibaraki et al reads on the claimed ratio of molar oxygen and carbon, since a particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation; therefore a *prima facie* case

of obviousness exists. See MPEP § 2144.05 II B. Regarding Claim 35, the raw material includes EAF dust, which is steelmaking dust. However, Ibaraki et al does not teach alkali and halogen contents, solubilizing alkali salts, producing a slurry with a pH of 7-11.5, providing a dehydrated material enriched in zinc and/or lead or a waste heat boiler and an air preheater.

Regarding alkali and halogen contents, Myerson et al teaches utilizing pH control in the recovery of metal and chemical values from industrial waste streams. Table I below shows a typical industrial waste stream:

TABLE I

Analysis of Fine Dust

Component	Weight Percent
zinc oxide	30.00
iron oxide	40.00
lead oxide and lead chloride	6.48
inert materials[1]	9.10
sodium oxide and sodium chloride	5.00
calcium oxide	2.80
potassium oxide and potassium chloride	3.00
manganese oxide	1.29
tin oxide	1.13
aluminum oxide	0.38
magnesium oxide	0.33
chromium oxide	0.16
copper oxide	0.06
silver	0.05
unidentified materials[2]	0.22

The ratio of $[(Na_2O + NaCl) + (K_2O + KCl)]$ to $(ZnO + PbO)$ is within the claimed range. It would have been obvious to one of ordinary skill in the art at the time the invention was made that the powdery raw material of Ibaraki et al would be the same as that taught by Myerson et al, since both Myerson et al and Ibaraki et al both teach the same endeavor of treating furnace dust from the same type of metalworking processes.

Regarding solubilizing alkali salts, Roux et al teaches treating steelworks dust. The method includes a washing step to separate the water soluble saline fractions of the insoluble oxides (abstract). It would have been obvious to one of ordinary skill in the art at the time the

invention was made to expect that any saline fractions in the powdery raw material would dissolve in water of Ibaraki et al in view of Myerson et al, since Roux et al also teaches using water as the solvent. Additionally, the solubility of the saline compounds would be consistent with the same type of dust.

Regarding producing a slurry with a pH of 7-11.5, it would have been obvious to one of ordinary skill in the art at the time the invention was made to produce a slurry with a pH of 7-11.5 of Ibaraki et al in view of Myerson and Roux et al, since Ibaraki et al teaches conditions sufficient to solubilize any salts (up to 100% moisture), operating conditions which would be consistent with the claimed property of pH.

Regarding providing a dehydrated material enriched in zinc and/or lead, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the dehydrated material of Ibaraki et al would be enriched with zinc and or lead, Ibaraki et al teaches that the dehydrated conditions are less than the vaporization point of those metals or their oxides (column 8, lines 38-53).

Regarding providing a dehydrated material enriched in zinc and/or lead, Hoffman et al teaches a method and apparatus of iron-making/steel-making using a modified rotary hearth furnace (abstract). The invention can include utilizing tempered flue gas in a cogeneration scheme whereby the sensible heat is converted to steam by way of heating boiler feed water in a waste heat boiler. The generated steam could then be converted in electricity (column 7, lines 26-31). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a waste heat boiler in the process of Ibaraki et al, since the generation of

electricity is a known work in one field of endeavor and is predictable to one of ordinary skill in the art.

Regarding Claim 28, Table I of Myerson et al teaches alkali metals and halogen elements within the claimed range.

Response to Arguments

Applicant's arguments with respect to claims 26-33, 35, 37, 38 and 41-43 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. WO 9319213 teaches removing lead and zinc from metallurgical works dust (title). The dust is heated to evaporate chlorine, alkaline and lead compounds. Carbon is then added to the dusts, and the zinc oxide is reduced to zinc in another furnace.

Claims 37, 38 and 41-43 are free from prior art rejections. Myerson et al (US 5,942,198), cited in the previous office action, teaches the benefication of furnace dust that can include fly ash (column 8, line 26). However, Myerson et al '198 teaches leaching zinc. The cited prior art does not disclose or suggest adding fly ash or an -OH group as a pH adjustor.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TIMA M. MCGUTHRY-BANKS whose telephone number is (571)272-2744. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George Wyszomierski/
Primary Examiner
Art Unit 1793

/T. M. M./
Examiner, Art Unit 1793
24 June 2009